

## CLAIM OR CLAIMS

### WHAT IS CLAIMED IS:

1. A tracking generator for an RF measurement instrument of the type having  
5 a controller and a receiver comprising:
  - means for generating a baseband signal under control of the controller;
  - means for modulating the baseband signal with a modulation oscillator  
frequency to produce a modulation signal; and
  - means for mixing the modulation signal with a local oscillator frequency  
10 from the receiver to produce a test signal having an output frequency that  
matches a measurement frequency for the receiver.
2. The tracking generator as recited in claim 1 further comprising means for  
offsetting the output frequency from the measurement frequency.
- 15 3. The tracking generator as recited in claim 2 wherein the offsetting means  
comprises means in the generating means for providing an offset in the  
baseband signal.
- 20 4. The tracking generator as recited in claim 2 wherein the offsetting means  
comprises means for adaptively filtering the baseband signal by lowpass  
filtering the baseband signal when a small offset in the baseband signal is  
desired and bandpass filtering the baseband signal in a frequency band above  
a Nyquist band when a larger offset in the baseband signal is desired.

5. The tracking generator as recited in claim 2 wherein the offsetting means comprises means for adjusting the local oscillator signal prior to input to the mixing means.
- 5      6. The tracking generator as recited in claim 2 wherein the offsetting means comprises means for controlling a modulation oscillator frequency for the modulating means to produce an offset in the modulation signal.
7. The tracking generator as recited in claim 6 wherein the modulation  
10      oscillator frequency comprises an intermediate oscillator frequency from the receiver.
8. The tracking generator as recited in claim 6 wherein the modulation oscillator frequency comprises an internal local oscillator frequency.
- 15      9. The tracking generator as recited in any of claims 1-6 wherein the generating means comprises:  
                    means for pre-processing digital data to provide a baseband digital signal in response to control by the controller; and  
20                    means for converting the baseband digital signal to a baseband analog signal as the baseband signal.
10. The tracking generator as recited in claim 9 wherein the baseband signal comprises a complex vector baseband signal having an in-phase and a

quadrature-phase component and the modulating means comprises:

a pair of mixers, each mixer having as inputs respectively one of the in-phase and quadrature-phase components and respectively an in-phase and a quadrature-phase frequency component of the modulation oscillator

5 frequency; and

means for combining the outputs of the mixers to produce the modulation signal.

11. The tracking generator as recited in claim 10 wherein the in-phase and  
10 quadrature-phase frequency components are derived from an intermediate oscillator frequency from the receiver.

12. The tracking generator as recited in claim 9 wherein the baseband signal  
comprises a tone signal and the modulating means comprises a mixer for  
15 mixing the tone signal with the modulation oscillator frequency to produce the modulation signal.

13. The tracking generator as recited in claim 9 wherein the mixing means  
comprises an output mixer having as inputs the modulation signal and the  
20 local oscillator frequency to produce at an output the test signal.

14. A method of producing a test signal from a tracking generator within an RF instrument of the type having a controller and a receiver comprising the steps of:

generating a baseband signal under control of the controller;

modulating the baseband signal with a modulation oscillator frequency  
to produce a modulation signal; and

5       mixing the modulation signal with a local oscillator signal from the  
receiver to produce the test signal having an output frequency that matches a  
measurement frequency for the receiver.

15. The method as recited in claim 14 further comprising the step of offsetting  
the output frequency from the measurement frequency.